

WHAT IS CLAIMED IS:

1. A system for wireless data transmission, comprising:
 - a plurality of stationary primary antennas; and
 - a plurality of secondary antennas situated on a rotating body;wherein a first primary antenna transmits electrical energy to the secondary antennas, and a second primary antenna is provided for at least bi-directional communications for data exchange with the secondary antennas.
2. The system as recited in claim 1, wherein the secondary antennas are positioned on a carrier band placed on the rotating body.
3. The system as recited in claim 2, wherein the carrier band is a rim band positioned on a circumference of a wheel rim.
4. The system as recited in claim 1, wherein the primary antennas are situated on the wheel housing of a vehicle, and wherein the main emitting direction of the primary antennas is towards the direction of a corresponding wheel in the wheel housing, and at an angle downwards relative to the horizontal plane of a road surface below the wheel.
5. The system as recited in claim 4, further comprising:
 - a processing unit for controlling the energy transmitting operation and the communications operation of the primary antennas, wherein the processing unit is able to change the operation mode of the second primary antenna between the communications operations for data exchange and the transmitting operation for the energy transmission.
6. The system as recited in claim 4, further comprising:
 - a synchronization device for synchronizing the second

primary antenna operating in the communications operation mode with the first primary antenna operating in the energy transmitting operation mode.

7. The system as recited in claim 6, wherein the primary antennas operate at a carrier frequency approximately in the gigahertz range.

8. The system as recited in claim 6, wherein a quadratic amplitude modulation is used for data transmission from the secondary antennas to the primary antennas.

9. The system as recited in claim 5, further comprising:
an energy storage medium connected to the secondary antennas for storing the energy transmitted by the primary antennas.

10. The system as recited in claim 5, wherein the secondary antennas are arranged in a plurality of rows.

11. The system as recited in claim 6, further comprising:
a selection device for selecting a desired number of secondary antennas among the plurality of secondary antennas for communications with at least one of the first and second primary antennas.

12. The system as recited in claim 6, further comprising:
a selection device for deactivating, if the vehicle exceeds a predefined speed, a first selected number of the secondary antennas and operating a second selected number of secondary antennas for communications with at least one of the first and second primary antennas.